

## **HR-264 Development of Sufficiency Rating System for Secondary Roads**

**Key Words:** Secondary roads, Rating roads, Sufficiency rating

### **ABSTRACT**

The objective of this study was to produce a sufficiency rating system which could be used to evaluate the adequacy of secondary roads in Iowa. The system to be developed should be reasonably easy to use, yet yield results which are compatible with current processes used in priority pro-gramming.

Models currently being used for primary roads are empiri-cal in nature, in that they are numerical ratings which re-late well to 'experience based' adequacy ratings. It fol-lows that the experience of local engineering practitioners should figure heavily in determining the form of the pro-posed model. To that end, a questionnaire was developed which could be used to survey local engineering practition-ers, mostly county engineers. A statistical analysis of the responses provided the basis for the formation of the model proposed in this report.

The model that is proposed uses the same format used by the Arizona Highway Department for the first sufficiency rating system, developed in 1946. This format was adopted because it is well known, widely accepted, and comparatively easy to use. It also is considered to yield reasonable re-sults that are reproducible.

Rating criteria selection (and their relative weights) was based on the responses to the questionnaire. Scaling factors were based on the relative weights suggested by the responses and the model used by the Iowa DOT for primary roads. Maximum scores were established, using a set of de-sign standards adopted for the model. Failure to meet the 'standard' represented a 'deficiency', the amount of defi-ciency dependent on how close the rated road segment came to meeting the standard. The concept of 'tolerability' figured heavily in forming the scales used with the criteria. This concept, discussed in detail in Volume I of this report is predicated on the supposition that there exists (for each rating criterion) a 'tolerable' standard which is less de-sirable than the 'ideal', but still considered safe (or least acceptable). A comparative level was selected for the tolerable value (based on currently used models) and scales were graduated.

The worksheets and Guide in Appendix C were developed to aid users of the system in applying the model to roads in their jurisdiction. Revisions to the forms were made, using the experience gained in the testing of the model. Some of the revisions made as a result of the tests produced a more uniform model for all functional classes of roads to be evaluated. Variations in the resultant ratings are based on whether

the rated road segment is paved or unpaved and on the variability in design standards, based on functional class and annual daily traffic.

Some additional effort is needed to more easily access available data and more input is needed from potential and actual users, to refine the model. The comparative results produced by the trial runs do suggest that the model is usable and should prove to be compatible with other processes used to form priority lists for project programming. It should provide results that are reproducible and defensible.